Digital Amplifier Ultrasonic Sensor

E4C-UDA

CSM_E4C-UDA_DS_E_1_1

A Reflective Sensor That Handles All Types of Sensing Object Colors and Patterns

- Compact with a Broad Selection of Side-view Heads
- Slim Amplifiers with analog outputs
- Easy-to-read Digital Distance Display

⚠ Be sure to read *Safety precautions* on page 3.

Ordering Information

Sensor

Sensor Heads

Shape	Model	Measurement range	Model
M18	Straight	50 to 300 mm	**E4C-DS30**
	Side view		**E4C-DS30L**
	Straight	70 to 800 mm	**E4C-DS80**
	Side view		**E4C-DS80L**
	Straight	90 to 1000 mm	**E4C-DS100**

Note: Refer to the definition of resolution in the *Ratings and Specifications* tables for information on conditions required to achieve this resolution.

Amplifiers

Shape	Power supply	Output specifications	Model
	DC	NPN output	**E4C-UDA11**
			E4C-UDA11AN
		PNP output	**E4C-UDA41**
			E4C-UDA41AN

Ratings and Specifications

Sensor Heads

Item / Model	E4C-DS30	E4C-DS30L	E4C-DS80	E4C-DS80L	E4C-DS100
Measurement range	50 to 300 mm		70 to 800 mm		90 to 1,000 mm
Standard sensing object	100 × 100 mm SUS flat plate				
Near distance dead band	0 to 50 mm		0 to 70 mm		0 to 90 mm
Ultrasonic oscillation frequency	Approx. 390 kHz		Approx. 255 kHz		
Response speed	30 ms		100 ms		125 ms
Ambient temperature range	Operating: –25 to +70°C, Storage: –40 to +85°C (with no icing or condensation)				
Ambient humidity range	Operating and storage: 35% to 85% (with no condensation)				
Enclosure rating	IP65				
Indicator	(Yellow) Lit: Sensor within sensing range		(Yellow) Lit: Sensor within sensing range (Green) Lit: Power indicator		(Yellow) Lit: Sensor within sensing range
Weight	Approx. 150 g				Approx. 170 g
Accessories	Instruction Manual, XS2F-D523-D80-A (Cable length: 2 m), XN2A-1430				

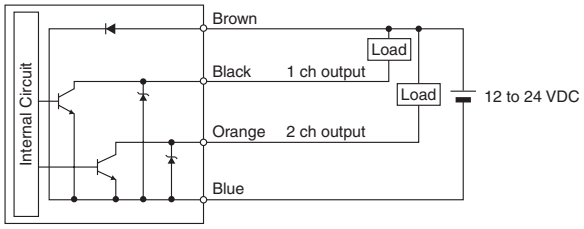
Amplifiers

Item / Model		E4C-UDA11	E4C-UDA41	E4C-UDA11AN	E4C-UDA41AN
Item / Type		Twin Output Models		Analog Output Models	
Output configuration		NPN output	PNP output	NPN output	PNP output
Connection method		Pre-wired			
Supply voltage		12 to 24 VDC ±10%, ripple 10% max.			
Current consumption		80 mA max.			
Control output		NPN open collector (26.4 VDC max.), Load current: 50 mA max., Residual voltage: 1 V max.			
Timer		OFF/OFF-delay/ON-delay/one-shot			
Timer time		1 ms to 5 s			
Analog output	Connected load	---		Voltage output (1 to 5 VDC)	
	Output form	---		10 kΩ min.	
	Temperature characteristics	---		0.3% F.S./°C	
	Resolution	---		2.0% F.S. ✻	
	Linearity	---		±2% F.S.	
Protective circuit		Power supply reverse polarity protection, output short-circuit protection			
Ambient temperature range		Operating: –25 to +55°C, Storage: –30 to +70°C (with no icing or condensation)			
Ambient humidity range		Operating and storage: 35% to 85% (with no condensation)			
Insulation resistance		50 MΩ min. (at 500 VDC)			
Dialectic strength		1,000 VAC, 50/60 Hz for 1 min			
Vibration resistance		10 to 150 Hz, 0.75-mm double amplitude, 80 min each in X, Y, and Z directions			
Shock resistance		500 m/s^2, 3 times each in X, Y and Z directions			
Enclosure rating		IP 50			
Materials		Case: PBT (polybutylene terephthalate), Cover: Polycarbonate			
Weight (packed state)		Approx. 150 g			
Accessories		Instruction Manual			

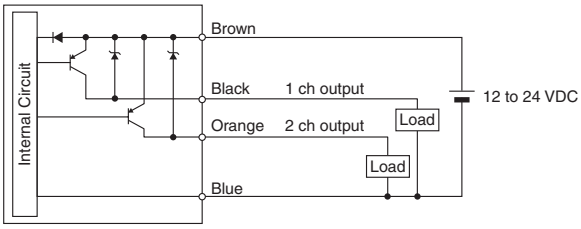
✻ Value one hour after the product is turned ON. External disturbances, however, sometimes cause minute outputs.

I/O Circuit Diagrams

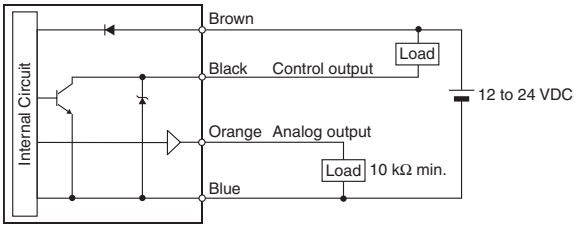
E4C-UDA11 (NPN)



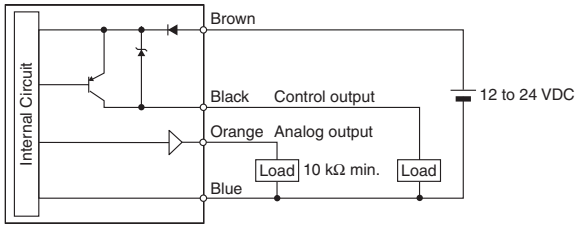
E4C-UDA41 (PNP)



E4C-UDA11AN (NPN)



E4C-UDA41AN (PNP)



Safety precautions

Refer to *Warranty and Limitations of Liability*.

⚠ WARNING

This product is not designed or rated for ensuring safety of persons either directly or indirectly. Do not use it for such purposes.

Precautions for Correct Use

Do not use the product in atmospheres or environmets that exceed product ratings.

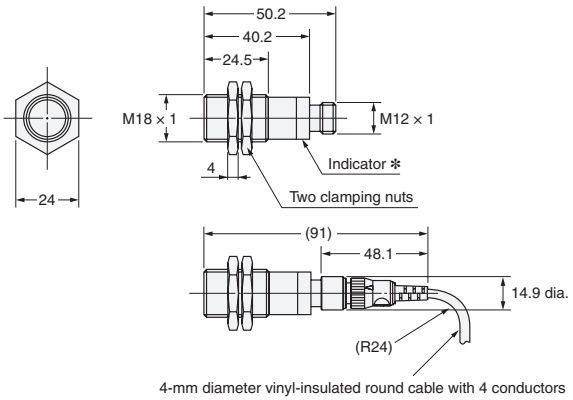
- Separate the Sensor wiring from power supply and high-voltage lines. If Sensor wiring is placed together with or in the same duct as power supply or high-voltage lines, inductance may cause malfunction or damage to the Sensor.
- The extended cable length must be no more than 10 m. To extend the cable length, use 0.3 mm^2 cable.
- Detection will be possible 200 ms or longer after the power supply is turned ON. If separate power supplies are used for the load and the Sensor, turn ON the power supply to the Sensor first.
- Make sure that the cover to the Amplifier is in place before using the Sensor.
- If a writing error occurs (ERR/EEP will flash on the display) due to noise resulting from turning OFF the power supply, static electricity, or other cause, initialize the settings using the SET switch on the Amplifier.
- Depending on the application environment, some time may be required for the displayed distance to stabilize after turning ON the power supply.
- Output pulses may be generated when the power supply to the Amplifier is turned OFF. Turn OFF the load or the power supply to the load before turning OFF the Sensor.
- Do not use thinners, benzine, acetone, kerosene, or any other petroleum solvents to clean the Sensor or Amplifier.
- Turn OFF the power supply before connecting or disconnecting the Sensor Head.
  Use only an E4C Sensor Head. The product may be damaged if any other Sensor Head is connected.
- The distance displayed on the Amplifier may be different from values obtained with tape measures or other devices.
  To adjust the displayed distance, use the scaling function.

Dimensions

(Unit: mm)
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

Sensor Heads

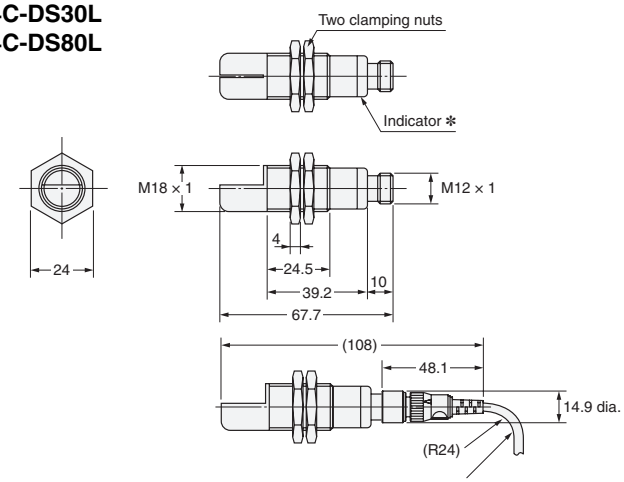
E4C-DS30
E4C-DS80



4-mm diameter vinyl-insulated round cable with 4 conductors
(cross-sectional of conductors: 0.2 mm², insulation system: 1.1-mm diameter), Standard length: 2 m

✻ E4C-DS30: Sensor within sensing range (Yellow)
E4C-DS80: Sensor within sensing range (Yellow), Power indicator (Green)

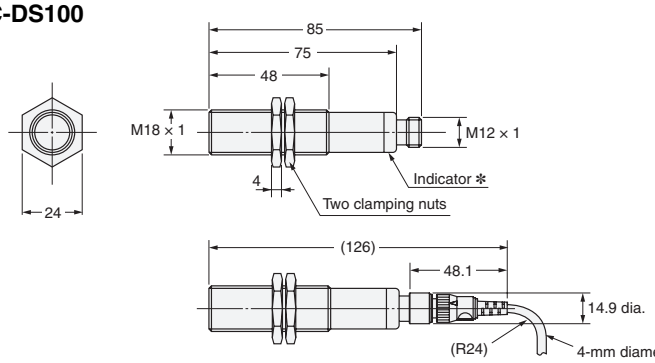
E4C-DS30L
E4C-DS80L



4-mm diameter vinyl-insulated round cable with 4 conductors
(cross-sectional of conductors: 0.2 mm², insulation system: 1.1-mm diameter), Standard length: 2 m

✻ E4C-DS30L: Sensor within sensing range (Yellow)
E4C-DS80L: Sensor within sensing range (Yellow), Power indicator (Green)

E4C-DS100

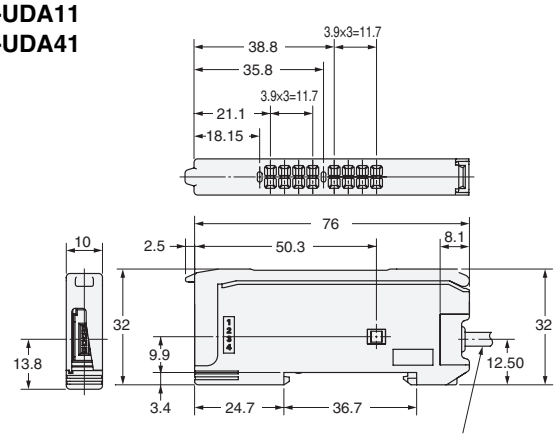


4-mm diameter vinyl-insulated round cable with 4 conductors
(cross-sectional of conductors: 0.2 mm², insulation system: 1.1-mm diameter), Standard length: 2 m

✻ Sensor within sensing range (Yellow)

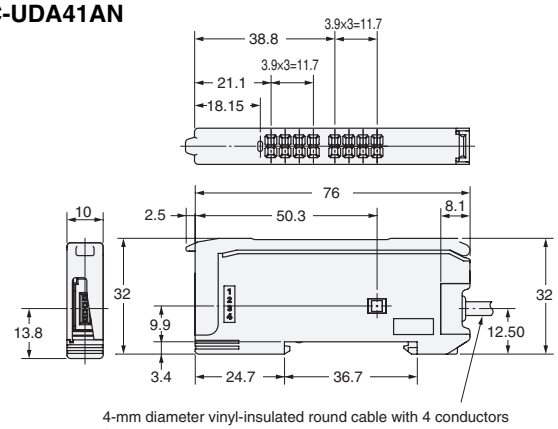
Amplifiers

E4C-UDA11
E4C-UDA41



4-mm diameter vinyl-insulated round cable with 4 conductors
(cross-sectional of conductors: 0.2 mm², insulation system: 1.1-mm diameter), Standard length: 2 m

E4C-UDA11AN
E4C-UDA41AN



4-mm diameter vinyl-insulated round cable with 4 conductors
(cross-sectional of conductors: 0.2 mm², insulation system: 1.1-mm diameter), Standard length: 2 m

Read and Understand This Catalog

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

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Application Considerations

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The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

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- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCTS ARE PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

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